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## BOOK REVIEWS.

NATURAL THEOLOGY. The Gifford Lectures Delivered Before the University of Edinburgh in 1893. By *Prof. Sir G. G. Stokes*, Bart. London : Adam and Charles Black. Chicago : A. C. McClurg & Co. 1893. Pp. 272. Price, \$1.50.

The object of Lord Gifford in founding the course of lectures which goes by his name and which is now so widely known, was to promote, advance, teach, and diffuse the study of natural theology in the widest sense of that term, in other words, "The Knowledge of God, the Infinite, the All, the First and Only Cause, the One and the Sole Substance, the Sole Being, the Sole Reality, and the Sole Existence, the Knowledge of His Nature and Attributes, the Knowledge of the Relations which men and the whole universe bear to Him, the Knowledge of the Nature and Foundation of Ethics or Morals, and of all Obligations and Duties thence arising.' Our readers are probably already acquainted with some of these lectures, all of which we believe have appeared in book-form, and especially with those of Prof. Max Müller, reports of which were published in *The Open Court* several years ago. The last course was delivered by Prof. Sir G. G. Stokes, a physical scientist of great ability, whose work, especially in optics, is celebrated. Unquestionably the views which an eminent practical scientist holds upon the question of Natural Theology should be of great interest, as characteristic of the thought of our time ; and in Professor Stokes's case this interest is unusually heightened since his views seem to run counter to the drift of speculation now generally prevailing among physicists.

Professor Stokes's lectures (this is the second course) are divided into two parts : the six lectures which form the first part deal with scientific subjects, in so far as these support the original thesis of Lord Gifford to which the lecturer is limited ; the remaining four lectures refer to distinctively Christian doctrines, in so far as these agree with the scheme of natural theology. In the first lecture, Professor Stokes takes up the history of the undulatory theory of light. He shows how we were led to this theory by other natural analogies familiar to us, and how we were gradually obliged to change the suppositions which we originally made and ultimately to assume the existence of certain properties of the ether which we do not meet with in the ordinary course of our experience of things, and which are in some

respects even mysterious ; in other words, the properties of the luminiferous ether turned out to be greatly different from what we first thought they were. The conclusion from this is, that if in this physical investigation we had displayed the same stubbornness which we now exhibit in theological [and spiritualistic] investigations, we should have missed great discoveries—discoveries which are now accepted as facts of actual, legitimate science ; and consequently that we are much more likely to make mistakes and miss things highly important to our welfare if, relying upon our knowledge of the laws of nature, we summarily dismiss the evidence of asserted facts, which, if true, are of a character to lie altogether outside of the ordinary course of nature. This point excellently characterises the expositions of the lecturer. It leads him to a notion of the supernatural or of events which do not belong to the ordinary familiar course of nature (although the argument really involves only the assumption of things unknown); and to the belief that the instantaneous communication of intelligence from one part of the universe to another is *possible* (Lecture II). It is not necessary to say that Professor Stokes also accepts as evidence of design the adaptedness of organs to their purposes (Lectures III and IV), and that though he accepts evolutionary processes (Lecture V) he yet contends that there is no incompatibility between evolutionary processes and the superposition thereto of occasional creative acts for special purposes (Lecture VI). With respect to the last four lectures we need only mention that the deficiencies which natural theology leaves in the scheme of divine moral government are, in the lecturer's view, in great part supplied by Christianity. It is Professor Stokes's belief that any divorce between natural theology and revealed religion is, in whichever aspect we look at it, to be deprecated.

The point which will claim most the attention of the philosopher or rather epistemologist in Professor Stokes's position is that expounded in the first lecture, namely, to what extent our holding fast to the received truths and ideas of science and to the facts with which we are familiar, will impede the further investigation of nature. His example from the theory of light is a good one, and might be supplemented by a score of others from all branches of science and art. But is Professor Stokes's analysis of this example correct?

The mysterious properties to which Professor Stokes refers are the facts that if the luminiferous ether exists it must at the same time behave like an elastic solid in resisting the gliding of one portion over another, and yet like a fluid in letting bodies pass freely through it. That it exists, Professor Stokes has no doubt. But the existence of nondescript things and their explanation are different matters. Certainly, the discovery of strange things is allowable, but their *explanation* is something which must be effected with reference to known, *familiar* things. This is the case with the above-mentioned property of the ether. It is strange and unfamiliar because it contradicts our ordinary experience, and it will remain such until it is reconciled with the latter. Of course, in this argument it is assumed that this property of the ether is a fact. But epistemologically it is not a fact, but the logical out-

come of an *hypothesis* which we have formed to facilitate our *view* of facts. Such hypotheses, if truly scientific and definitive, must follow what is called the principle of continuity; that is, they must attribute to the hypothetical entities they assume, such properties, and such only, as are not contradicted by our experience of "large" bodies. Perhaps this theory of research is wrong; but it is at least the one which has led to the greatest discoveries—even to the wave-theory of light. The conclusion of it is, not that the nondescript property of the ether referred to is a "great discovery," but rather that there is a very important problem presented here in connexion with the wave-theory of light, which if it cannot be explained *by reference to familiar established facts*, will ultimately render necessary a revision of the undulatory theory of light, in some such sense as took place when transverse vibrations were substituted for longitudinal.

But whether the author's analysis of the point in question is correct or not, the principle which it is used to establish, could be independently affirmed. If it is valid, then the whole history of science has been in vain. After all our struggles we have not really attained a scientific criterion of truth, and scientific criticism is stultified. Professor Stokes's solution of the problem, How shall research be conducted, gives free scope to the wildest vagaries of the spiritualist, and to the ignorant and incompetent of all classes, while it discredits the judgment of the trained critical inquirer and gives to every one, under the pretext of prejudice, the right to impugn the validity of scientific results.

T. J. McCORMACK.

ASPECTS OF THEISM. By *William Knight*, LL. D., Professor of Moral Philosophy in the University of St. Andrews. London and New York: Macmillan & Co. 1893. Price, \$2.25.

The twelve lectures which constitute this work were delivered at Dundee in 1870, at Salisbury in 1890, and at London in 1891. Its main conclusions were published in 1879 in Professor Knight's "Studies in Philosophy and Literature." The feature of the book is its statement that Theism must be treated as a problem of philosophy. No theory of things, the author justly argues, whether theological, scientific, or historical, which dispenses with philosophy, can have either an adequate basis or a root of endurance. The style of Professor Knight's work is remarkably clear and elegant—an excellence which is surpassed only by the outspokenness of its opinions.

In Professor Knight's view, though the ontological, cosmological, and teleological arguments all possess a germ of truth, each in itself is insufficient. His own argument or solution combines the points of view of *all* thought on this subject; it represents "the theistic view of the Universe as a focus at which the conclusions of "Speculative Philosophy, Science, Poetry, Art, History, and Religion meet—a "focus at which the personal and the impersonal view of the ultimate mystery combine." His argument is full of beauty and charm. But it is more a *feeling* than an argument, and to appreciate fully its strength one must have personal experience